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ORIGINAL RESEARCH

Dental Patient's Knowledge and Awareness Regarding Effects of Smoking on Oral Health among Smokers and Nonsmokers: A Comparative Study

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ABSTRACT

Aims and objectives: The aim of the present study is to examine the difference in dental patient's knowledge and awareness regarding effects of smoking on oral health between smokers and nonsmokers.

Materials and methods: A cross-sectional questionnaire-based survey was carried out among 199 dental patients from Sri Aurobindo Institute of Dental Science, Indore. A self-prepared questionnaire was used to assess the awareness regarding the effects of smoking on oral health. Chi-square test and multiple linear logistic regression model was applied using statistical package for social sciences (SPSS) software.

Results: The prevalence of smoking was 22.6%. Fewer smokers and tobacco users than nonusers thought that oral health and smoking are related (28.0 *vs* 63.3%, p = 0.009). Multiple linear logistic regression was used to assess the association of each variable with awareness, which showed that smokers are less aware of the oral health effects of smoking than the nonsmokers.

Conclusion: Smoking and tobacco using subjects are significantly less aware of the oral health effects of smoking as compared to nonsmokers. Comparative studies in other populations may be warranted to ascertain the validity of these results.

Keywords: Smoking, Oral health, Oral cancer, Periodontal disease, Knowledge.

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INTRODUCTION

Tobacco inhalation is inhalation of smoke from burned leaves of tobacco plant, most often in the form of cigarettes. Smokeless tobacco refers to chewing of tobacco. People may smoke casually for pleasure, habituality to satisfy an addiction, due to social pressure, etc. There is overwhelming evidence that tobacco usage produces harmful effects in the mouth.[1] WHO has reported that tobacco smoking have killed 100 million people worldwide in 20th century and warned that it could kill 1 billion people around the world in 21st century. Smoking has been established as a risk factor for death from several systemic diseases, including lung cancer, respiratory diseases and cardiovascular disease.[1,2] Smoking has also been demonstrated to affect the oral health of smokers in a variety of way ranging from cosmetic effects, such a tooth staining or discoloration, to potentially harmful life-threatening conditions such as oral cancer.[1,3] Some of the reported effects of smoking on oral health include increased susceptibility to periodontal disease, reduced response to both surgical and nonsurgical periodontal therapies,[4,5] increased risk of dental implant failure[6] and a higher risk for cancer and precancerous lesions.[7,8] In susceptible patients, the clinical effects of smoking depends on number of cigarettes smoked daily and the duration of the habit.[9]

Passive smoking includes inhalation of smoke from smoker's cigarette to another individual and it can cause increased allergic reactions against specific allergens, reduced lung function and increased asthmatic attacks in patients with asthma. Despite the above established negative effects of smoking on oral health, few studies examining dental patient's knowledge and awareness of such effects are available.[10,11] Moreover, the available studies have focused mainly on oral cancer and only a very few have examined the awareness regarding other oral health aspects, affected due to smoking. The aim of this study is to assess the awareness of smoking's effects on oral health among smoker and nonsmoker dental patients.

MATERIALS AND METHODS

A cross-sectional questionnaire-based survey was conducted during the month of January, 2012. The samples were selected randomly from general Outpatient Department (OPD) of Sri Aurobindo Institute of Dental Science, Indore.

Ethical clearance was obtained from ethical committee of Sri Aurobindo Institute of Dental Science, Indore. Informed consent was taken from the patient. The study consisted of 20 self-prepared questionnaires.

A total of 199 dental patients were approached, which included smokers, tobacco users and nonusers. The questionnaire included sociodemographic variables and knowledge about effects of smoking on oral health.

The questionnaire was tested on 15 patients prior to start of survey and unclear items were modified accordingly. The sociodemographic variables included age, gender, marital

status, education, living status and self reported smoking status. The sociodemographic variables were followed by special questions in which respondents were assessed about their knowledge/awareness regarding the effects of smoking on cancer, periodontal diseases, delayed wound healing and tooth staining, etc.

Data was analyzed using statistical package for social sciences (SPSS) version 17.0. Association between smoking status and sociodemographic characteristic with knowledge of each of the oral health effects and differences in knowledge between smokers, tobacco users and nonusers were assessed using Chi-square test.

The regression model used the dependent variable 'knowledge score' was calculated in following manner: A score of 1 was given of patient correctly responded to all four established effects (oral cancer, periodontal diseases, wound healing, tooth staining) as being influenced by smoking and a score of 0 was given if any of these variables was not selected. Independent variables entered in model were age range, sex, marital status, level of education and smoking status.

RESULTS

Table 1 reveals the sociodemographic characteristics of the subjects according to the smoking status. Out of the 199 patients, 22.6% were smokers, 9.5% tobacco users and 67.8% were nonusers. The number of self reported smokers and tobacco users were 45 (22.6%) and 19 (9.5%) respectively, among which 64 (32.1%) were males, 9% above poverty line, 5.5% educated and 25% were married.

Table 2 reveals the difference in knowledge of subjects about the effect of smoking on oral health according to smoking. 18.1% smokers, 9.5% tobacco users and 63.3% nonusers thought that smoking and oral health are related and only 18.1% smoker believed that smoking affect oral cancer. Additionally 16.6% correctly reported that caries was not affected by smoking. It also shows that 52.8% nonuser were having correct knowledge that is knowledge score was 1 while only 14.1% smokers were having knowledge score 1.

Table 3 reveals that multiple linear logistic regression analysis was used to assess the association of each variable with the knowledge. Knowledge score was used as a dependent variable and the sociodemographic factors as an independent variable. Smoking status was the only significant variable associated with the knowledge level.

DISCUSSION

In India, the use of tobacco is common in the form of chewing or smoking of bidis and cigarettes. Cigarette smoking affects oral health in a variety of ways ranging from staining to various serious conditions like oral cancer. Between these two extremities there are various effects of smoking on oral health which though not being as serious as oral cancer, still present potential for significant oral health morbidity and tooth mortality. Smokers are quite aware that a link exists between smoking and oral health in general and of specific effects of smoking on oral cancer, periodontal health and tooth staining. British doctor's study have shown that smokers are reducing their life length by an average of 7.5 years, irrespective of the type of tobacco smoked and the amount of daily smoking.[12]

In the present study smoking status was the only variable significantly associated with overall patient awareness of

Table 1: Sociodemographic characteristics of study subjects

Variable	*Smoker (N = 45) N (%)*	*Tobacco user (N = 19) N (%)*	*Nonuser (N = 135) N (%)*	*Total (N = 199) N (%)*	*p-value*
Sex					
Male	45 (22.6%)	19 (9.5%)	75 (37.7%)	139 (69.8%)	0.000
Female	0 (0%)	0 (0%)	60 (30.2%)	60 (30.2%)	
Education level					
Uneducated	10 (5.0%)	2 (1.0%)	23 (11.6%)	35 (17.6%)	0.068
Primary	17 (8.5%)	6 (3%)	30 (15.1%)	53 (26.6%)	
Secondary	9 (4.5%)	9 (4.5%)	39 (19.6%)	57 (28.6%)	
Graduated	9 (4.5%)	2 (1.0%)	43 (21.6%)	54 (27.1%)	
Marital status					
Married	36 (18.1%)	14 (7.0%)	101 (50.8%)	151 (75.9%)	0.759
Unmarried	9 (4.5%)	5 (2.5%)	34 (17.1%)	48 (24.1%)	
BPL status					
BPL	14 (7.0%)	4 (2.0%)	28 (14.1%)	46 (23.1%)	0.351
Non-BPL	31 (15.6%)	15 (7.5%)	107 (53.8%)	153 (76.9%)	
Age (years)					
<25	8 (4.0%)	9 (4.5%)	40 (20.1%)	57 (28.6%)	0.124
25-50	21 (10.6%)	7 (3.5%)	63 (31.7%)	91 (45.7%)	
>50	16 (8.6%)	3 (1.5%)	32 (16.1%)	51 (25.6%)	

Table 2: Reported knowledge of study subjects about the effect of smoking on oral health

Sr. no.	Variable	Smokers N (%)	Tobacco user N (%)	Nonuser N (%)	p-value	Total N (%)
1.	Smoking and general health are related	38 (19.1%)	18 (9.0%)	132 (66.3%)	0.003	188 (94.5%)
2.	Smoking and orodental health are related	36 (18.1%)	19 (9.5%)	126 (63.3%)	0.009	181 (91.0%)
3.	Smoking affect oral cancer	36 (18.1%)	19 (9.5%)	131 (65.8%)	0.000	186 (93.5%)
4.	Smoking affects wound healing	37 (18.6%)	18 (9.0%)	130 (65.3%)	0.006	185 (93.0%)
5.	Smoking affects tooth standing	41 (20.6%)	19 (9.5%)	133 (66.8%)	0.030	193 (97.0%)
6.	Smoking affects caries	32 (16.1%)	16 (8.0%)	118 (59.3%)	0.039	166 (83.9%)
7.	Smoking affects periodontal health	30 (15.1%)	16 (8.0%)	117 (58.8%)	0.010	163 (81.9%)
8.	Smoking affects oral ulcers	31 (15.6%)	18 (9.0%)	121 (66.8%)	0.001	170 (85.4%)
9.	Smoking affects halitosis	37 (18.6%)	17 (8.5%)	128 (64.3%)	0.031	182 (91.5%)
10.	Smoking affects the taste	27 (13.6%)	16 (8.0%)	113 (56.8%)	0.003	156 (78.4%)
11.	Smoking affects health of gums	30 (15.1%)	15 (7.5%)	129 (64.8%)	0.000	174 (87.4%)
12.	Knowledge score					
	1	28 (14.1%)	14 (7.0%)	105 (52.8%)	0.121	147 (73.9%)
	0	17 (8.5%)	5 (2.5%)	30 (15.1%)		52 (26.1%)

Table 3: Logistic regression analysis of factors associated with knowledge levels regarding effect of smoking on oral health

Sr. no.	Factors	B (SE)	OR (CI)	p-value
1.	Smoking status	1.069 (0.466)	2.912 (1.168)	0.022
2.	Education level	0.086 (0.557)	1.090 (0.366)	0.877
3.	Marital status	0.864 (0.625)	2.373 (0.697)	0.167
4.	Sex	–0.697 (0.451)	0.498 (0.206)	0.122
5.	Age	0.625 (0.620)	0.535 (0.159)	0.313

these effects assessed through an 'awareness score' based on the overall numbers of correctly identified effects by the subjects. This association was independent of age, gender, marital status or education level.

The majority of subjects in this study were aware of smoking effects on tooth staining (97%), delayed wound healing (93%), oral cancer (93.7%) and halitosis (91.5%). Awareness levels decreased with other variables of periodontal health (81.5), alteration of taste (78.4). Thus, the results obtained from this study indicates that the level of awareness is increased among dental patients regarding the effects of smoking on oral health as compared to results obtained from the previous researches.[13]

Furthermore, awareness among smokers can be confirmed by the knowledge score obtained (73.9 *vs* 26.1%) which indicates that the dental patients have an increased awareness regarding effects of smoking on oral health.

Most of the smokers in this study were males. The reason behind this may be the workload and the stress that the males have to face in the family. On the other hand, Indian females who are much more concerned regarding the social status, avoid these adverse habits. Among males there is an increased prevalence of smoking in the married subjects as compared to the unmarried subjects which brings into notice that as the responsibilities increases, people start these adverse habits.

In India, since most of the people are below the poverty line, they have to face many problems and so as to overcome the stress and depression due to these problems, they start up with the smoking which they believe that it relives them from stress.

Many studies have been undertaken to highlight the link between smoking and periodontal disease.[14,15] With many authors stressing that effects on periodontal disease and periodontal therapy are heavily influenced by smoking. In terms of periodontal treatment, there was a poorer prognosis for treatment success especially when periodontal surgery was carried out on smokers.[16] Other studies have highlighted smoking as a significant risk factor for development of early onset periodontitis, localized gingival recession and attachments loss at specific sites have been attributed to the use of chewable tobacco products. Effects of smokeless tobacco are localized to the site of placement where it produces localized gingival recession.[17] There is also a link between smokeless tobacco with leukoplakia and oral carcinomas.

About 30% of all cancer diseases and deaths are caused by tobacco smoking.[18] Smokers are more likely than nonsmoker to develop oral cancer. There is a dose response relationship for tobacco use and the risk of the development of oral cancer.[1] Use of smokeless tobacco products increases the risk of cheek, gums and lips by about 50 times as compared with nonsmokers. People, who stop using tobacco, even after many years of use, can greatly reduce the risk of all smoking related illness, including mouth cancer.

Smoking is one of the causes of tooth staining and halitosis. Smoking inhibits salivary flow and thus causes halitosis. Nicotine present in the toxic contents of cigarette reduces nutritional blood flow to skin, resulting in tissue ischemia and impaired healing of the injured tissue.[19]

It has long since been recognized that dental health professional have a key role in educating and informing their patients about the health risks of smoking and also supporting smokers in the cessation of this habit.[13]

The FDI urges its member associations and all oral health professionals to take decisive actions to reduce tobacco use and nicotine addiction among the general public.[1] The entire dental team should be aware of the relationship between smoking and dental problems, the goal of which is to ensure that all patients who smoke are routinely identified, monitored and appropriately taken care of. Studies have already shown that the use of an educational pamphlet about the effects of smoking on oral cancer significantly improved smoking patient knowledge to levels similar to nonsmokers.[20,21] The effects of education on actual quit rates are more difficult to demonstrate, though, due to the complex, multifactorial etiology and psychology of smoking.[22]

Nowadays as the education level is increasing people have become much more aware regarding the negative effects, which has lead to reduction in the total number of present smokers. It has increasingly been recognized globally that all oral health professionals should integrate tobacco use prevention and cessation services into their daily practice.

CONCLUSION

The results attained from this study implicate that the smokers and tobacco users have less awareness regarding the effects of smoking on oral health as compared to nonsmokers. A proper training or education may be the most significant method to increase the awareness against smoking among dental patients and the population in general.

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